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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
PATENT DOCKET RM. 4A59
PO BOX 8, BLDG. K-1 ROSS
NISKAYUNA, NY 12309

EXAMINER

MITCHELL, KATHERINE W

ART UNIT

PAPER NUMBER

3673

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,142

Applicant(s)

SIVAVEC ET AL.

Examiner

Katherine W Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 36-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 and 44-66 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 36-43, drawn to method of monitoring PRB treatment and evaluating performance of PRB in treating contaminated groundwater, classified in class 210, subclass 739.
 - II. Claims 1-35 and 44-66, drawn to system and method comprising PRB zone to treat contaminated groundwater and in-well sensor to sense characteristics of said groundwater, classified in class 405, subclass 128.45.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as monitoring a process and evaluating process manually without in-well sensors. See MPEP § 806.05(d).
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Noreen Johnson on Oct 15, 2002 a provisional election was made with traverse to prosecute the invention of system and method of contaminated groundwater treatment using PRB and in-well sensors, claims

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1-35 and 44-66. Affirmation of this election must be made by applicant in replying to this Office action. Claims 36-43 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Examiner notes that the original restriction was just to claims 44-66; however, upon further consideration, claims 1-35 and 44-66 are related enough to include together.

Specification

5. The disclosure is objected to because of the following informalities:

On page 7, "unit" refers to various units, including a sensing unit (28), a transceiver unit (26), and an unnumbered communication unit. To avoid confusion, the word "unit" should always be preceded by an adjective describing the unit, as was not done on page 7 paragraph 0033.

On page 8, paragraph --37 begins with "ExampleIn this example" which should be corrected.

On page 8, paragraph 0037 discloses "PRB zone 12", while paragraph 0038 discloses "sensors 12". Applicant should review specification to ensure "12", "PRB zone", and "sensors" are always correctly identified.

On page 10, there is a large gap of about a half a blank page at the beginning of paragraph 0044. Applicant should review to ensure there is no text, figure, table, or graph missing.

On page 11, paragraph 0045, "high dissolved (DO)" is missing the word -- oxygen--

Appropriate correction is required.

Claim Objections

6. Claim 14 is objected to because of the following informalities: In line 6, "ate" should be --at--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 6-8, 52-54 and 58-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6-8 and 52-54 recite the limitation "each well open screen interval" in lines 3-4 of each claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 58 recites the limitation "the data collector" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 59 is disclosed as depending from claim 59. For purposes of examination, examiner assumes claim 59 depends from claim 58. Claims 60-63 are rejected as depending from claim 59.

Claim 59 teaches that the communication link comprises a web connection. Claim 61, which depends of claim 59, discloses that the communications link comprises something other than a web connection, which is a contradiction.

Claims 64-65 recite the limitation "plurality of wells" in line 2 of each claim. There is insufficient antecedent basis for this limitation in the claim. Examiner notes that both

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claims depend from claim 44, which has an in-well sensor but no teaching of a plurality of wells, and the specification allows a plurality of sensors in a single well.

Claim 66 recites "a transect of flow", but does not state to what the transect is relative. Examiner is very unclear what is being claimed, but will assume applicant intends to claim a sensor on a plane perpendicular to the plane of the groundwater flow.

Claims 61 and 63 disclose a list of unclearly related alternatives. A Markush Group and its application are discussed in the MPEP Paragraph 2173.05(h).

I. MARKUSH GROUPS

Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being "selected from the group consisting of A, B and C." See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925).

Ex parte Markush sanctions claiming a genus expressed as a group consisting of certain specified materials. Inventions in metallurgy, refractories, ceramics, pharmacy, pharmacology and biology are most frequently claimed under the Markush formula but purely mechanical features or process steps may also be claimed by using the Markush style of claiming. See *Ex parte Head*, 214 USPQ 551 (Bd. App. 1981); *In re Gaubert*, 524 F.2d 1222, 187 USPQ 664 (CCPA 1975); and *In re Harnisch*, 631 F.2d 716, 206 USPQ 300 (CCPA 1980). It is improper to use the term "comprising" instead of "consisting of." *Ex parte Dotter*, 12 USPQ 382 (Bd. App. 1931).

The use of Markush claims of diminishing scope should not, in itself, be considered a

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sufficient basis for objection to or rejection of claims. However, if such a practice renders the claims indefinite or if it results in undue multiplicity, an appropriate rejection should be made.

Similarly, the double inclusion of an element by members of a Markush group is not, in itself, sufficient basis for objection to or rejection of claims. Rather, the facts in each case must be evaluated to determine whether or not the multiple inclusion of one or more elements in a claim renders that claim indefinite. The mere fact that a compound may be embraced by more than one member of a Markush group recited in the claim does not necessarily render the scope of the claim unclear. For example, the Markush group, "selected from the group consisting of amino, halogen, nitro, chloro and alkyl" should be acceptable even though "halogen" is generic to "chloro."

The materials set forth in the Markush group ordinarily must belong to a recognized physical or chemical class or to an art-recognized class. However, when the Markush group occurs in a claim reciting a process or a combination (not a single compound), it is sufficient if the members of the group are disclosed in the specification to possess at least one property in common which is mainly responsible for their function in the claimed relationship, and it is clear from their very nature or from the prior art that all of them possess this property. While in the past the test for Markush-type claims was applied as liberally as possible, present practice which holds that claims reciting Markush groups are not generic claims (MPEP § 803) may subject the groups to a more stringent test for propriety of the recited members. Where a Markush expression is applied only to a portion of a chemical compound, the propriety of the grouping is determined by a consideration of the compound as a whole, and does not depend on there being a community of properties in the members of the Markush expression.

When materials recited in a claim are so related as to constitute a proper Markush group, they may be recited in the conventional manner, or alternatively. For example, if "wherein R is a material selected from the group consisting of A, B, C and D" is a proper limitation, then "wherein R is A, B, C or D" shall also be considered proper.

Subgenus Claim

Genus, subgenus, and Markush-type claims, if properly supported by the disclosure, are all acceptable ways for applicants to claim their inventions. They provide different ways to present claims of different scope. Examiners should therefore not reject Markush-type claims merely because there are genus claims that encompass the Markush-type claims. See also MPEP § 608.01(p) and § 715.03.

Claims 61 and 63 include the expression "or combinations thereof". A more clear wording would be the Markush phrasing discussed, beginning with the phrase --at least one selected from the group consisting of--.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-14, 17, 20-35, and 44-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borden et al. in view of Misquitta US Patent 5639380.

Re claims 1 and 44: Borden et al. teach a method comprising conducting a PRB treatment of a contaminated aqueous medium and in-well monitoring effectiveness of the PRB treatment in col 10 lines 28-44 and col 13 lines 43-50. Examiner notes that Borden et al. do not explicitly state that the monitoring is in-well. However, col 13 lines 43-50 and col 16 lines 12-18 imply that the monitoring is done in-well, as the monitoring wells are used to collect data, and no mention is made of extracting samples to analyze ex-situ. Misquitta teaches in-well monitoring in Figs 5 and 10 and col 6 lines 47-60. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borden et al. to include in-well monitoring as taught by Misquitta in order to obtain accurate and dynamic readings of groundwater parameters with a minimum of on-site manpower.

Re claim 17: Reactive material in the barrier zone is taught by Borden et al in col 10 lines 28-35 and col 11 lines 10-15.

Re claims 45-46: A monitor is taught by Misquitta in col 6 lines 47-60 and the abstract. Absent any criticality, the location of the monitor outside the PRB would be an obvious design choice, and be particularly likely if the PRB contained hazardous or damaging chemicals. Note that Misquitta states the obvious, in col 5 line 64 – col 6 line

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6, that the test setup can be inside or outside the contaminated area based on site conditions.

Re claims 2-14, 20-30, and 47-54: Borden et al. teach up-gradient and down-gradient monitoring wells in col 12 lines 41-44 and col 13 lines 35-50. Fig 1 teaches monitoring probes located along a transect of the PRB zone and shows the wells placed within 25 and 6 feet up- and down- gradient of the PRB. A plurality of sensors is taught in col 11 lines 32-45, col 13 lines 42-48 and Fig 1. Designing the system to meet site requirements is taught in col 7 lines 55-63. Monitoring wells have an open screen interval to allow the monitored fluid to flow into the well, as disclosed in Borden et al. col 10 lines 51-53. Including wells within 2 feet of the PRB or within the PRB would have been an obvious result of routine experimentation. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have located the monitoring wells with in-well sensors in certain locations relative to the contamination, both vertically and horizontally, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Examiner notes that routine experimentation, based on contamination levels and types, site conditions and limitations, soil permeability, and other factors known to influence remediation work, would be routinely required in any remediation or site assessment project, and notes that Borden et al. in col 13 lines 48-51 and col 11 lines 43-45 teach that additional wells are determined based on pilot studies. Adjusting the treatment

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based on monitoring data is taught by Borden et al. in col 11 lines 43-45 and Misquitta in Fig 6. The method is obvious in the system description and usage.

Re claims 31-35 and 55-62: A transmitter, collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link between said collector and monitor and the method of monitoring and transmitting contaminant data is taught in Misquitta in col 6 lines 47-60 and col 7 lines 7-21. Col 8 lines 14-40 teach wireless interconnected {web} communication links using radio communications. Transmission of data implies a remote monitor. Two way communication is taught by Misquitta in col 6 line 61- col 7 line 1, Fig 6, and col 10 lines 41-46. Outputting a contaminant report is taught by Misquitta in col 7 lines 40-49 and col 10 lines 35-36.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borden et al. to include a transmitter, a collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link between said collector and monitor as taught by Misquitta in order to automate the monitoring process and obtain "real-time" data and process corrections as elaborated in col 10 lines 41-46.

Re claim 63: Borden et al. teach chemical sensors in Fig. 3. Misquitta teaches chemical sensors in col 7 lines 4-7.

Re claims 64-65: A plurality of sensors in a plurality of wells {a plurality of monitoring wells with sensors} arranged along a substantially longitudinal axis of the

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PRB zone facing the fluid flow (AA-116,115, and 113) and substantially along a transect to the PRB zone (AA-111,112,113, and 114) is taught in Fig. 1.

Re claim 66: A PRB and a sensor located along a substantially longitudinal axis of the PRB zone facing the fluid flow (AA-116,115, and 113) or substantially along a transect to the PRB zone (AA-111,112,113, and 114) is taught in Fig. 1.

11. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borden et al. in view of Misquitta US Patent 5639380 as applied to claims 1 and 17 above, and further in view of Salvo et al. US Patent 6356205. As discussed above, Borden et al. in view of Misquitta teach all the elements except monitoring effectiveness using at least pH, O-R potential, or specific conductivity. Borden et al. teach monitoring based on electron acceptors and donors entering and being released from the barrier in col 11 lines 40-44. Salvo et al teach in Fig 3 and col 7 lines 42-45 that pH, O-R potential, and/or specific conductivity are measured and used to determine effectiveness. Salvo et al in col 8 lines 9-13 and Borden et al. in col 5 lines 37-46 and col 11 lines 33-45 teach that determining the nature, extent and velocity of a contaminant plume are part of the treatment method. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borden et al. in view of Misquitta to include monitoring effectiveness using at least pH, O-R potential, or specific conductivity, as taught by Salvo et al., in order to monitor specific parameters indicative of groundwater remediation that can be determined by sensors in monitoring wells.

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12. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borden et al. in view of Misquitta US Patent 5639380 as applied to claim 17 above, and further in view of EPA/600-R-99/095a "An In Situ Permeable Reactive Barrier for the treatment of Hexavalent Chromium and Trichloroethylene in Groundwater: Vol 1, hereafter called the EPA report. As discussed above, Borden et al. in view of Misquitta teach all the elements except forming the PRB by digging a trench and placing reactive material within the trench and conducting PRB treatment within the trench, with the trench in the path of the contaminated plume. The EPA report teaches a PRB trench filled with reactive iron as a barrier on page 8 last 4 paragraphs, page 18 1st paragraph, and Figs. 18B and 52 A and B. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borden et al. in view of Misquitta to include forming the PRB as a trench filled with reactive materials to form a permeable "wall" in the flow path as taught by the EPA report to ensure the contaminant plume intersects with the reactant using easy and known methods of forming barriers in the ground.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W Mitchell whose telephone number is 703-305-6713. The examiner can normally be reached on Tues-Fri 9 AM - 7:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 703-306-4115. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-308-8623 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

kwm


J. J. SWANN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600